WHAT IS CLAIMED IS:

1. A cache control program to be executed by a file controller including a disk device that records a plurality of objects accessed by a client machine and a cache section that stores a copy of at least one of the objects, wherein when the client machine tries to access one of the objects recorded in the disk device, the file controller sends the copy of said object to the client machine if the copy of said object is in the cache section, and wherein each object is one of a primary object, a secondary object, and a tertiary object, the tertiary object being configured by at least one secondary object, the secondary object being configured by at least one primary object, and the primary, secondary, and tertiary objects configuring different hierarchical levels, the cache control program controlling the file controller, the cache control program when executed comprising the steps of:

managing the cache section as a plurality of cache extents;

generating a plurality of cache IDs, each including a hierarchical level of an object and an object identification used to identify the objects of each hierarchical level from each other;

generating a cache header table indicating the relation of the cache IDs and the cache extents in each hierarchical level, wherein the cache header table contains cache headers that hold the cache IDs and a plurality of keys, each being unique and used for one of the cache IDs; and

searching the cache header table when the client machine tries to access one of the objects recorded in the disk device with the cache ID and the key of said object.

2. The program according to claim 1, further

comprising the step of:

binding a cache extent that is bound with a primary object with cache extents of the secondary and tertiary objects corresponding to the cache extent of said primary object based on the cache header of each hierarchical level.

3.   The program according to claim 1, further comprising the steps of:

storing a map for binding the objects of different hierarchical levels; and

searching the objects of different hierarchical level with reference to the map.

4.   The program according to claim 1, wherein the table is formed from a plurality of blocks, each configured by a plurality of entries, the program further comprising the steps of:

generating a map for managing the cache extents with the entries; and

searching the map in response to an access by the client machine.

5.   The program according to claim 1, wherein the client machine and the file controller are connected to a network having a plurality of nodes, the file controller being one of the nodes, and each of the cache IDs includes an identification number of a node in a certain domain of the network, the program further comprising the step of:

distributing the cache header table between the nodes through the network.

6.   A cache control method performed by a file controller including a disk device that records a plurality of objects accessed by a client machine and a cache section

48

that stores a copy of at least one of the objects, wherein
when the client machine tries to access one of the objects
recorded in the disk device, the file controller sends the
copy of said object to the client machine if the copy of
5 said object is in the cache section, and wherein each object
is one of a primary object, a secondary object, and a
tertiary object, the tertiary object being configured by at
least one secondary object, the secondary object being
configured by at least one primary object, and the primary,
10 secondary, and tertiary objects configuring different
hierarchical levels, the cache control method comprising the
steps of:

     managing the cache section as a plurality of cache
extents;

15   generating a plurality of cache IDs, each including a
hierarchical level of an object and an object identification
used to distinguish the objects of each hierarchical level
from each other;

     generating a cache header table indicating the relation
20 of the cache IDs and the cache extents in each hierarchical
level, wherein the cache header table contains cache headers
that hold the cache IDs and a plurality of keys, each being
unique and used for one of the cache IDs; and

     searching the cache header table when the client
25 machine tries to access one of the objects recorded in the
disk device with the cache ID and the key of said object.

     7.   A file controller for use with a client machine,
the file controller including a disk device that records a
30 plurality of objects accessed by the client machine and a
cache section that stores a copy of at least one of the
objects, wherein when the client machine tries to access one
of the objects recorded in the disk device, and the copy of
said object is sent to the client machine if the copy of

49

said object is in the cache section, and wherein each object is one of a primary object, a secondary object, and a tertiary object, the tertiary object being configured by at least one secondary object, the secondary object being

5 configured by at least one primary object, and the primary, secondary, and tertiary objects configuring different hierarchical levels, the file controller including control logic which when executed performs steps comprising:

managing the cache section as a plurality of cache

10 extents;

generating a plurality of cache IDs, each including a hierarchical level of an object and an object identification used to identify the objects of each hierarchical level from each other;

15 generating a cache header table indicating the relation of the cache IDs and the cache extents in each hierarchical level, wherein the cache header table contains cache headers that hold the cache IDs and a plurality of keys, each being unique and used for one of the cache IDs; and

20 searching the cache header table when the client machine tries to access one of the objects recorded in the disk device with the cache ID and the key of said object.

8. A recording medium encoded with a cache control

25 program for execution by a file controller including a disk device that records a plurality of objects accessed by a client machine and a cache section that stores a copy of at least one of the objects, wherein when the client machine tries to access one of the objects recorded in the disk

30 device, the file controller sends the copy of said object to the client machine if the copy of said object is in the cache section, and wherein each object is one of a primary object, a secondary object, and a tertiary object, the tertiary object being configured by at least one secondary

object, the secondary object being configured by at least
one primary object, and the primary, secondary, and tertiary
objects configuring different hierarchical levels, the cache
control program controlling the file controller, the cache
5   control program when executed performing the steps
comprising:

　　　managing the cache section as a plurality of cache
extents;

　　　generating a plurality of cache IDs, each including a
10 hierarchical level of an object and an object identification
used to identify the objects of each hierarchical level from
each other;

　　　generating a cache header table indicating the relation
of the cache IDs and the cache extents in each hierarchical
15 level, wherein the cache header table contains cache headers
that hold the cache IDs and a plurality of keys, each being
unique and used for one of the cache IDs; and

　　　searching the cache header table when the client
machine tries to access one of the objects recorded in the
20 disk device with the cache ID and the key of said object.

　　　9.　A cache control method for a file transferred
through a network between a client machine and a plurality
of file servers, each of the file servers including storage
25 for storing the file and a cache memory having a plurality
of cache extents, the method comprising:

　　　dividing the file in accordance with the size of the
file into a plurality of objects;

　　　dispersing each of the objects to one of the file
30 servers;

　　　dividing the corresponding object into a plurality of
disk blocks in each file server and storing the disk blocks
in the storage of the file server;

　　　copying at least one of the disk blocks related with

the file in each file server, when the file is read, onto at least one cache extent of the cache memory of the file server while generating a table for binding the cache extent of at least one of the disk blocks, the objects, and the

5   file to one another;

referring to the table with each file server to check whether the cache memory of each file server has a cache extent bound to the file when the client machine tries to access the file; and

10   accessing the cache extent with each server when there is a cache extent bound to the file.

10.   The method according to claim 9, wherein the table includes:

15   an object table indicating the relation of the file and the objects;

a storage extent table indicating the relation of each object and the disk blocks; and

a cache header table indicating the relation of the

20   cache extents and the file, the relation of the cache extents and the objects, and the relation of the cache extents and the disk blocks.